

### REMARKS

Claims 1-14 are pending in the application. Claims 1-14 are rejected. Claims 1, 3, 7, 10 and 12 have been amended. Claims 1 and 12 are independent claims. Reconsideration of the above referenced application is respectfully requested based upon the amendments to the base claims and comments below.

The drawings have been objected to for failing to show an 'X-cut type Mach-Zehnder interference type light intensity modulator.' Applicant notes that the boilerplate "the drawings must show every feature of the invention specified in the claims" is in fact, incorrect, as the USPTO issues patents without any drawings all the time. Before one applies 37 C.F.R. §1.83, one must read 37 C.F.R. §1.81(a) which states:

(a) The applicant for a patent is required to furnish a drawing of his or her invention where necessary for the understanding of the subject matter sought to be patented... (Emphasis added).

In the present case, it is not believed that a person of ordinary skill in the art would need to see drawings of an X-cut type Mach-Zehnder interference type light intensity modulator to understand one embodiment of the present invention. Therefore, withdraw of the object to the drawings and the rejection of dependent claims is respectfully requested.

Claims 1 is rejected under 35 U.S.C. § 112, first paragraph as failing to comply with the enablement requirement. In response, applicants have amended the base claim to provide antecedent basis to 'a precoded NRZ optical signal.' No new matter was added.

Claim 1 and 12 have been amended to disclose that the NRZ optical signal generator and the duobinary signal generator are configured so that each bit of the NRZ optical signal at a node O is light phase modulated, where said modulator shifts the phase of the optical signals from 0 to  $\pi$  or from  $\pi$  to 0 so that bits of '1' located at both sides of each bit of '0' have different phases

from each other. In addition, dependent claims 3 and 10 have been amended to reflect proper antecedent basis. Support for this amendment is found in the specification Page 10 line 20 – 22 and page 11, line 1. No new matter was added.

Claim 1-13 stand rejected under 35 U.S.C. § 102(e) as allegedly anticipated by Ono (US 6,388,786). In response, applicants have amended the base claim to disclose features not shown in the prior art reference Ono and provide the following comments.

Claims 1, as amended now recites, a duobinary optical transmission apparatus, comprising, inter alia, an NRZ optical signal generator arranged to receive an NRZ electrical signal, to modulate the optical carrier into an NRZ optical signal according to the NRZ electrical signal, and to output the NRZ optical signal to a node O ; and a duobinary optical signal generator ..., wherein the NRZ optical signal generator and the duobinary signal generator are configured so that each bit of the NRZ optical signal at node O, the light phase modulator shifts the phase of the optical signals from 0 to  $\pi$  or from  $\pi$  to 0 so that bits of '1' located at both sides of each bit of '0' have different phases from each other. Similarly, claim 12 discloses a method for doing the same.

In contrast, Ono provides a method of generating a duobinary signal where an electric signal drives an optical modulator and is binary (Col. 2, line 44 to 46). Applicants understanding of Ono is that that reference merely discloses that the duobinary signals are phase modulated and inverted when the intensity modulation signal is '0' (Col. 4, line 46 – 49). On the other hand, the present invention provides an improvement over the prior art specifically related to the deterioration in output signals caused by lengths of a pseudo random bit sequence (PRBS), inter alia and found that in the prior art . . . "[i]n general, the slope of a signal that is converted from level 0 into level 1 is different from the slope of a signal that is converted from level 1 into

level 0" (Page 4 line 16-22 and page 5 1-2). Moreover, the solves the problem found in the prior art where parts of the signal having different slopes overlap by having bits of '1' located at both sides of each bit of '0' have different phases from each other as disclosed in the amended claims (Page 4, line 16-22 to Page 5 line 1-2).

Therefore, Ono fails to anticipate the present invention by failing to show a feature disclosed in the base claims, wherein the NRZ optical signal generator and the duobinary signal generator are configured so that each bit of the NRZ optical signal at node O, the light phase modulator shifts the phase of the optical signals from 0 to  $\pi$  or from  $\pi$  to 0 so that bits of '1' located at both sides of each bit of '0' have different phases from each other.


Applicants respectfully request withdrawal of this ground of rejection.

The other claims in this application are each dependent from the independent claim discussed above and are therefore believed patentable for the same reasons. Since each dependent claim is also deemed to define an additional aspect of the invention, however, the individual consideration of the patentability of each on its own merits is respectfully requested.

For all the foregoing reasons, it is respectfully submitted that all of the present claims are patentable in view of the cited reference. A Notice of Allowance is respectfully requested.

Respectfully submitted,

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